



V-Y Advancement flap for Sacral Pressure Sore

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Abstract

Background: *The sacral region is one of the most frequent sites of pressure sore development. Debridement of pressure sores in the sacral region often results in excessive soft tissue defect. Numerous surgical methods have been used to correct these defects, including skin grafting, local flaps, muscle flaps and free flaps. This study was for evaluation of V-Y advancement gluteus maximus fasciocutaneous flap in management of sacral pressure sores.*

Keywords: *Gluteal area, Lesions, V-Y design.*

Introduction

Lesions in gluteal area secondary to congenital, traumatic, infectious, neurologic or ablative surgeries require reconstructive procedures. Different techniques have been described utilizing all the reconstructive ladder.¹⁻³ The use of local flaps is not a simple procedure. Availability of a pedicle near by the defect with an adequate territory to cover and fill the defect without donor defect is not the common scenario.

The V-Y advancement flap was credited by Dieffenbach in 1845. Later, changes made to the design including the triangular form, opposed shape, multiple flaps, and a Pacman flap design.⁴⁻⁶ Also, V-Y flap may be part of other flaps like the Manta Ray flap, five flap or cone flap.⁷⁻⁹ The V-Y advancement flap has been used extensively in face, trunk, and limb reconstruction.¹⁰⁻¹² The aim of this study was to optimize the use of V-Y flaps

for reconstruction of the gluteal area with closure of donor site primarily in one stage procedure.

Materials & Methods

A prospective study was conducted between December 2014 and May 2016, in patients who were admitted for sacral pressure sores in Department of Plastic surgery in Victoria hospital attached to Bangalore Medical college & Research Institute. Thirteen patients were operated with V-Y flap for lesions in perineal areas. Each patient received a full surgical explanation and a written consent was obtained. A separate informed consent for photography was obtained from all patients. The lesion was carefully cleaned and all diseased tissues and bursa were excised. Any bony prominence was carefully removed. V-Y flap was used unilaterally or bilaterally according to the size of the defect.

The perforator was identified by the help of Doppler probe and the fascia was incised to the underlying muscle. The distal edge of the rotation flap was de-epithelialized and buried under the distal edge of the defect to ensure complete filling and obliteration of the defect. Cone flaps were used for trochanteric defects. Starting with the first component of the cone flap, as a rotation flap to cover the primary defect. The second component was a V-Y flap to close the donor site.

Results

Of 13 patients with pressure sores, 7 were males and 6 were females. V-Y (Unilateral or bilateral) flaps were used for closure. The sores ranged in size from 8 to 18cm in diameter (mean 12cm). Seven sores that ranged from 8 to 12cm (mean 11.4cm) were reconstructed with unilateral flap, and six sores that ranged from 12 to 18 (mean 15.2cm) were reconstructed with bilateral flaps.

Fig 1 & 2 represent the distribution of cases between males and females and also about the different complications encountered.

Of the 13 cases only 1 patient developed partial failure in secondary healing of wound and 1 patient required re advancement and rest had no complications and showed better wound healing at follow up.

Fig 1: Distribution between male & females

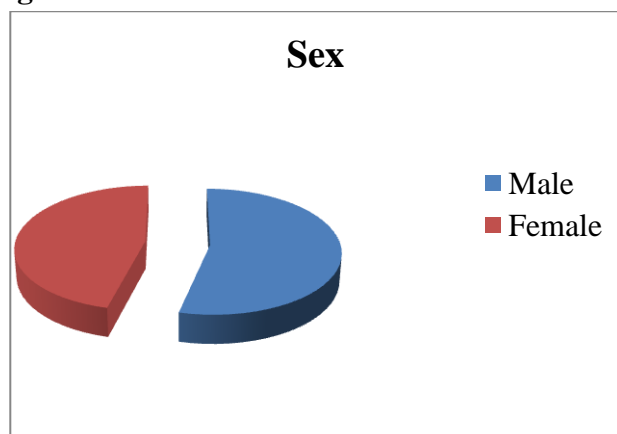


Fig 2: Complications after the procedure

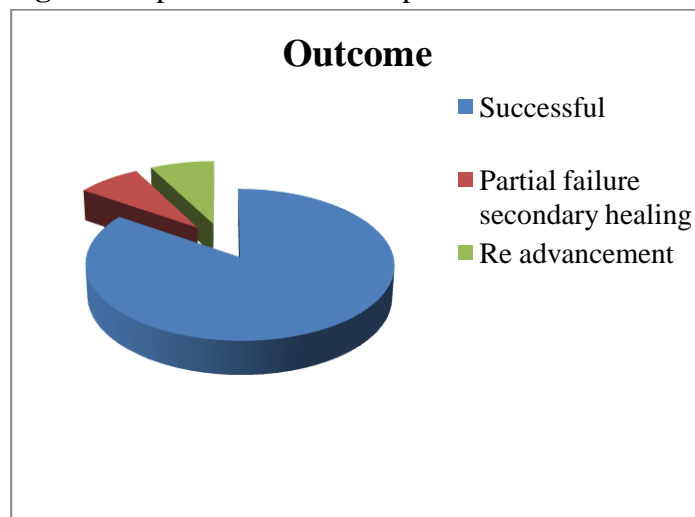


Fig 3: Pre-operative defect



Intra operative unilateral flap advancement



Post-operative appearance of wound



Fig 4: Pre-operative wound in another case



Post-operative bilateral flap advancement



Fig 5: Defects & management of pressure sore in other cases



Discussion

One of the distinct differences in gluteal reconstruction compared with lower extremity reconstruction is the effectiveness of local pedicled flaps in this region.¹³ The gluteal area is liable to considerable pressure in all positions (sitting and recumbent). Even during walking, motions can make tension across the incision lines. Urinary and fecal contamination add additional risk factor for wound healing.¹⁴

The gluteus maximus muscle is the commonest flap. It can be designed as an advancement, rotation flap, island flap, or split flap. The

decision depends on the size of the defect. Also, the superior gluteal artery flap had been used. However, this flaps needs learning curve and cannot be used again in recurrent cases.¹⁵⁻¹⁷ The gracilis muscle flap has its place for reconstruction of ischial area. It can be used as a vascular conduit for the skin island or the muscle itself can be used with some modification.^{18,19} Like other flaps, it cannot be used again and confined to the ischial area.

As regard the tensor fascia latae flap, it was used extensively for the trochanteric area.²⁰ Possibility of skin graft to the donor site, limited arc of rotation and cannot be used again are limitations for its use. In this work, Cone flap was ideal for the trochanteric area, where the donor site is a problem due to presence of septa. Closure of the defect with a rotational flap based on an audible perforator without any tension is mandatory for successful reconstruction. Then the V-Y flap was harvested secondarily for closure of the donor site. by adapting this policy, possibility of disruption due to tension became minimal.

Actually, fasciocutaneous flaps better used in males. The abundant fat in females may impair blood supply and delay healing. Moreover, co morbid conditions which are the primary causes for most of the lesions in the perineal area, add more difficulty to the wound healing process (Figure 5).

Repair strength varies considerably with the repair method, including blood supply, size and design of the flap. V-Y advancement flap is easier to execute. The flap has an excellent blood supply (based on a perforator with no tension in closure), filling and obliteration of the defect and can be raised safely without dissecting of the pedicle and filling and obliteration of the defect. It is a robust flap, which can be quickly harvested, and has got a lesser learning curve.

Despite the limited number of patients, this technique is simple and reliable and offers an effective and elegant alternative to the more classic operations for problematic wounds in lower limb as it has the advantage of being

tension-free closure without leaving dead space and no need for drains, thus increasing patient comfort and wound healing, and decreases the length of hospital stay with early return to work.

Careful planning of the flap and hearing of perforators by Doppler probe is mandatory. The night before operation, three successive rectal enema after light super are needed. Purse string suture around the anal verge with 1 silk suture is the first step to prevent fecal contamination of field. After elevation of the flap, intraoperative Doppler is used for confirmation of blood supply to the flap. No undermining is made to close the vertical limb of the V-Y flap. Creation of potential spaces may lead to collection and wound disruption. Save the time and improve healing by suturing the flap in one layer. Any sutures included the fatty layer or fascia may impair vascularity and produce fat necrosis and wound infection in consequence.

Constipating measures and avoidance of pressure on the flap for the first 10 days are very important for successful outcome. Drains removed when the amount is less than 25 ml and clear yellow in color. Treatment of the wound like an abscess rather than a surgical wound is a unique character of this area. In summary, Time-honored principles of replacing like with like and delivering well-vascularized tissue remain for defects in the perineal area. Filling and obliteration of the cavity is the cornerstone for good healing and minimizing recurrence of the lesion.

The ideal reconstruction is not by doing free flaps or by using advanced expensive tools but by providing simple, durable coverage with less morbidity to donor and recipient sites. Pedicled flaps has the upper hand for reconstruction in the gluteal area. Design of the flap as a V-Y ensures safe coverage with closure of donor site primarily.

Conclusion

The success of the design of the gluteus maximus fasciocutaneous flap depends on the following factors: Accurate assessment of the defect size (apparent vs. true), closure of the donor defect

first to achieve a locking barrier, and inserting of the flap without tension. These factors will allow for a smooth and complication free outcome, and a short duration of surgery. V-Y advancement flap can be first option as its robust blood supply, reliable anatomy and can be readvanced if partial necrosis happens.

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